AMENDMENTS TO THE DRAWINGS

FIG. 4 has been amended so that S470 and S480 therein are consistent with paragraph [53] of the specification. Specifically, the "output interpolative field MC mode" is amended to the "output interpolative frame MC mode" in S470; and the "output interpolative frame MC mode" is amended to "output interpolative filed MC mode" in S480".

No new matter is added.

Attachment: One (1) Replacement Sheet

REMARKS

Reconsideration and allowance of this application are respectfully requested.

I. Summary of Non-Final Office Action

Claims 1-13 are pending.

Claim 13 is rejected under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory subject matter.

Claim 11 is rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Maturi et al. (USP 5,731,850; hereinafter "Maturi").

Claims 1-3, 6-8, 12, and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Maturi in view of Ishikawa (USP 2002/0168008 Al), and in view of Legall (USP 5,878,166A).

II. Summary of Amendments

Applicant amends paragraph 59 of the specification. Paragraph 3 is also amended to correct a minor typographical error.

Applicant amends claims 11 and 12 to more clearly define the subject matter therein.

Applicant adds new claims 14-16 to more fully cover the present application.

Applicant amends Fig. 4 to correct minor typographical errors. Amended drawing is consistent with paragraph 53 of the specification.

Applicant submits that no new matter is added in amending the specification, claims and a drawing, and respectfully requests entrance of the amended parts of the application.

III. Analysis of Rejection under 35 U.S.C. § 101

As noted above, paragraph 59 of the specification is amended by deleting the phrase "carrier waves (transmission over the Internet)" so that the claimed computer readable medium may not read as including non-statutory subject matter.

Thus, Applicant respectfully submits that claim 13 complies with 35 U.S.C. § 101, and requests withdrawal of the rejection.

IV. Analysis of Rejection under 35 U.S.C. § 102(b)

As noted above, claim 11 is amended. The amendment is made to the last paragraph of the claim as follows:

> an MC mode determination unit which receives the SADs as inputs, and determines an MC mode based on the SADs, wherein the MC mode is determined not using any of an interpolative frame SAD, an interpolative top field SAD, and an interpolative bottom field SAD.

Applicant submits that the claimed picture encoding apparatus would not have been anticipated by Maturi at least because, while the Encoding Decision Block 66 of Maturi determines the size of a block-matching search area in a reference frame, it does not determine an MC mode based on the SADs.

Further, it should be noted that the present application is characterized in that, for the purpose of reducing the computation amount, the MC mode determination unit does not use

interpolative ME/MC units which outputs interpolative SADs while prior arts use the interpolative SADs to determine an MC mode as described in Fig. 1 and paragraph 42.

Applicant, therefore, respectfully submits that the claimed picture encoding apparatus defies patentable subject matter.

V. Analysis of Rejection under 35 U.S.C. § 103(a)

The Examiner alleges that method claim 1 would have been obvious over Maturi in view of Ishikawa and Legall. Applicant respectfully disagrees for the following reasons.

[Maturi]

In support of rejection of claim 1, the Examiner first cites col. 12 to allege that all the claimed SADs in step (a) are disclosed by Maturi.

In step (a), the defined inputs are: a forward frame SAD, a sum of a forward top field SAD and a forward bottom field SAD, a backward frame SAD, and a sum of a backward top field SAD and a backward bottom field SAD. Maturi appears to disclose using different kinds of SADs which may correspond to the above-listed SADs. However, at least a forward (backward) frame SAD among the above-listed SADs is not disclosed by this reference.

As recited in step (a), the forward (backward) frame SAD is differentiated from the sum of a forward (backward) top field SAD and a forward (backward) bottom field SAD. On the contrary, the reference describes in col. 12, lines 4-10 that an SAD for the entire macroblock, corresponding to a forward (or backward) frame SAD, is obtained by adding the odd-odd field SAD, corresponding to a forward (or backward) top field SAD, and the even-even field SAD,

corresponding to a forward (or backward) bottom field SAD, where each of the odd-odd field SAD and even-even field SAD is calculated independently.

Rephrasing this description over the claimed method, the forward (backward) frame SAD is obtained by adding the forward (or backward) top field SAD and the forward (or backward) bottom field SAD. Assuming, arguendo, that the "Entire Macroblock" SAD of the first row of the Table (col. 12 of Maturi) corresponds to a forward (or backward) frame SAD, the Table does not show the sum of a forward (or backward) top field SAD and a forward (backward) bottom field SAD. Thus, one of the forward (or backward) frame SAD, and the sum of a forward (backward) top field SAD and a forward (or backward) bottom field SAD is not disclosed by Maturi. The missing SAD in the reference disclosure is the forward (or backward) frame SAD.

Obtaining the entire macroblock SAD by adding the odd-even field SAD and the even-odd field SAD (col. 12, lines 10-19) is irrelevant as long as the entire macroblock SAD is obtained by adding two different field SADs.

Briefly, even though the reference may disclose the sum of a forward (or backward) top field SAD and a forward (or backward) bottom field SAD, it does not disclose the forward (or backward) frame SAD. Thus, Maturi first fails to disclose step (a) of the claimed method.

Maturi also fails to disclose step (b) of identifying a minimum value of the SADs as opposed to the Examiner's allegation that step (b) is disclosed by Maturi's Motion Estimator 16 which chooses the minimum of the two SADs.

The two SADs, from which the minimum is selected, are an SAD adding the odd-odd field SAD and the even-even field SAD, and an SAD adding the odd-even field SAD and the even-odd field SAD. Here, the minimum SAD is selected from the SADs of a same directional reference frame (forward or backward). In other words, the odd-odd field SAD and the even-even field SAD are obtained by comparing the current frame and one of the forward and backward frames. Maturi does not teach that the odd-odd field SAD is obtained from forward direction comparison, and the even-even field SAD is obtained from backward direction comparison, while the claimed method includes both forward field SADs and backward field SADs.

Moreover, Maturi does not teach that the minimum value (SAD) is identified among the four SADs obtained in step (a); it only suggests the minimum SAD is identified between two frame SADs.

Therefore, Applicant submits that Maturi fails to disclose both of steps (a) and (b) of the claimed method.

[Ishikawa]

The Examiner alleges that Ishikawa teaches step (c) of the claim (a thresholding technique) since the reference discloses a similar method to determine inter-frame or intra-frame encoding of a block by comparing an error value to a threshold as set forth in paragraph 35 of the reference.

However, the cited part of Ishikawa is only directed to selection between inter-frame coding and intra-frame coding, but not to selection between different inter-frame MC modes which may correspond to the SADs obtained in step (a). It is well known that intra-frame coding is about reducing spatial redundancies within a frame, while the inter-frame coding is about reducing temporal redundancies between neighboring frames. The claimed method is directed to the latter inter-frame coding, and more particularly, to MC mode determination which concerns only inter-frame coding. Selection between inter-frame coding and intra-frame coding is not relevant.

Therefore, Applicant submits that Ishikawa does not disclose "selecting an MC mode corresponding to the minimum value" as recited in step (c) of the claim.

[Legall]

Since Maturi does not teach an interpolative MC mode, and Ishikawa does not teach a choice between a field MC mode and a frame MC mode, the Examiner alleges that Legall discloses step (c) of selecting one of an interpolative frame MC mode and an interpolative field MC mode.

However, the cited part of Legall simply lists available directional coding modes such as forward, backward and bi-directional coding, but does not teach how any of the coding modes is selected as claimed. That is, Legall does not disclose selection of an MC mode between a field MC mode and a frame MC mode based on the minimum SAD selected among 4 different SADs obtained in step (a)

Therefore, Applicant submits that Legall fails to disclose step (c) of the claim.

[Non-Obviousness]

As analyzed thus far, as each of the references (Maturi, Ishikawa and Legall) fails to teach the respective step(s) of the claimed method, the references should be determined to fail to teach or suggest all the limitations of the claimed method, taken alone or in combination. Therefore, the claimed method would not have been obvious over the references.

Applicant also submits that the Examiner's obvious combination (or incorporation) allegation also does not meet the requirements of obviousness.

Returning to Maturi, this reference is particularly directed to MC mode selection between a full-search mode and a hierarchical block-matching search mode (not a directional and field/frame mode selection). At best, Maturi appears to teach selection of the minimum value of two entire macroblock SADs in a same directional mode. However, both of those two SADs are calculated referring to only one directional reference frame (forward or backward).

That being said, there is no suggestion or motivation to apply Ishikawa's threshold technique of inter-frame/intra-frame coding mode to selecting the minimum SAD, because mode selection between inter-frame and intra-frame coding is not directed to either of Maturi's MC mode selection and the claimed MC mode determination.

In addition, while Legall may teach MC mode selection between frame mode and field mode, and between unidirectional (forward and backward) and bi-directional modes, this reference does not teach or suggest a method of not using the bi-directional (i.e., interpolative)

SADs in comparing directional SADs. Thus, even though the teaching of Legall is incorporated into Maturi so that the reference may be modified, persons of ordinary skilled in the art would not have been led to the claimed method which selects an MC mode according to particular operations (c) and (d) as recited in the claim.

Therefore, Applicant respectfully submits that the claimed MC mode determination would not have been obvious over the reference. For the same reasoning, corresponding claims 6, 13 and amended claim 12 would not have been obvious over the references. Note here that claim 12 is amended by incorporating existing claim 11 (before the amendment therein).

Claims 2 and 7 should be allowable at least due to their dependency.

VI. New Claims

In this Amendment, Applicant adds new claims 14-16 to more fully cover the present application.

Claims 14 and 15 corresponds to amended claim 11. Claim 16 further defines claim 6 based on Figs. 3-5 and corresponding descriptions in the specification.

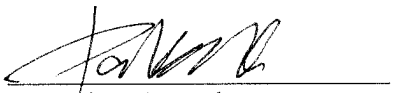
Applicant respectfully submits that the new claims also define patentable subject matter.

VII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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